

**BAYPORT SHIP CHANNEL CONTAINER/CRUISE TERMINAL  
ENVIRONMENTAL IMPACT STATEMENT**

**TABLE OF CONTENTS**

<b><u>Section</u></b>	<b><u>Page</u></b>
<b>VOLUME I</b>	
<b>EXECUTIVE SUMMARY .....</b>	<b>ES-1</b>
<b>VOLUME II</b>	
<b>1.0 PURPOSE OF AND NEED FOR THE ACTION .....</b>	<b>1-1</b>
1.1 PROJECT OVERVIEW .....	1-1
1.2 ROLES AND RESPONSIBILITIES .....	1-2
1.2.1 Alternative Actions Available to the USACE .....	1-2
1.2.2 USACE Considerations in the NEPA and Permit Processes .....	1-3
1.2.3 Definition of Alternatives .....	1-3
1.3 PROJECT BACKGROUND .....	1-3
1.3.1 The Port of Houston .....	1-3
1.3.2 The Port of Houston Authority .....	1-4
1.3.3 The Bayport Channel .....	1-4
1.4 STATEMENT OF NEED FOR ACTION (PROVIDED BY APPLICANT) .....	1-5
1.4.1 Summary .....	1-5
1.4.2 Container Terminal Facilities .....	1-5
1.4.3 Cruise Terminal Facilities .....	1-7
1.5 THE USACE DETERMINATION OF PROJECT PURPOSE AND NEED PURSUANT TO NEPA AND THE CLEAN WATER ACT .....	1-7
1.5.1 USACE Definition of Project Purpose and Need .....	1-7
1.5.2 USACE Review of the Applicant's Statement of Need .....	1-8
<b>2.0 PROJECT ALTERNATIVES .....</b>	<b>2-1</b>
2.1 INTRODUCTION .....	2-1
2.2 PROCESS TO IDENTIFY REASONABLE AND FEASIBLE ALTERNATIVES .....	2-1
2.2.1 Location, Land Area, and Access Requirements for New Container Terminal Complexes .....	2-1
2.2.2 Site Development Requirements for a Container Terminal Complex .....	2-2
2.2.3 Site Identification Process .....	2-2
2.2.3.1 Tier 1 Evaluation to Identify Potential Terminal Location Alternatives .....	2-3
2.2.3.2 Results of the Tier 1 Evaluation Process .....	2-3
2.2.3.2 Tier 2 Evaluation to Identify Potential Terminal Location Alternatives .....	2-4
2.3 ALTERNATIVES CONSIDERED AND DISMISSED .....	2-6
2.3.1 Results of the Tier 2 Evaluation Process .....	2-6
2.3.2 Conclusions of the Tier 2 Evaluation Process .....	2-7
2.3.3 The Tier 3 Evaluation Process .....	2-8
2.3.3.1 Sites Large Enough to Individually Provide Adequate Berth Length and Backland Area .....	2-8

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	2.3.3.2 Sites Not Large Enough to Individually Provide Adequate Berth Length and Backland Area .....	2-10
	2.3.3.3 Combinations of Sites .....	2-11
	2.3.3.4 Results of the Tier 3 Evaluation Process .....	2-12
	2.3.3.5 Conclusions of the Tier 3 Evaluation Process .....	2-12
2.4	ALTERNATIVES IDENTIFIED FOR FURTHER ANALYSIS .....	2-14
2.4.1	Elements Common to All Action Alternatives .....	2-14
	2.4.1.1 Container Terminal Complex .....	2-14
	2.4.1.2 Cruise Terminal Complex .....	2-14
2.4.2	The No Action Alternative .....	2-15
2.4.3	Bayport Terminal Location Alternative .....	2-16
	2.4.3.1 Container Terminal Complex .....	2-17
	2.4.3.2 Cruise Terminal Complex .....	2-17
	2.4.3.3 Proposed Navigational Improvements and Projected Dredged Volumes .....	2-18
	2.4.3.4 Wetlands Mitigation .....	2-19
	2.4.3.5 Schedule of Development .....	2-20
2.4.4	Spilmans Island Terminal Location Alternative .....	2-20
2.4.5	Shoal Point Terminal Location Alternative .....	2-21
2.4.6	Cedar Point Terminal Location Alternative .....	2-21
2.4.7	Pelican Island Terminal Location Alternative .....	2-22
2.4.8	Shoal Point/Bayport Terminal Location Alternative .....	2-23
2.4.9	Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	2-23
2.5	COMPARISON OF ALTERNATIVE LOCATIONS AND THEIR IMPACTS .....	2-24
2.5.1	Introduction .....	2-24
2.5.2	Land Use and Coastal Zone Management .....	2-24
2.5.3	Socioeconomics .....	2-24
2.5.4	Social Characteristics and Environmental Justice .....	2-25
2.5.5	Surface Transportation .....	2-26
2.5.6	Community Infrastructure and Municipal Services .....	2-27
2.5.7	Navigation .....	2-28
2.5.8	Noise and Vibration .....	2-28
2.5.9	Aesthetics and Light .....	2-28
2.5.10	Cultural Resources .....	2-29
2.5.11	Parks and Recreation .....	2-29
2.5.12	Air Quality .....	2-30
2.5.13	Public Safety .....	2-30
2.5.14	Hazardous Materials .....	2-31
2.5.15	Shoreline Erosion .....	2-31
2.5.16	Hydrology, Drainage, and Flooding .....	2-32
2.5.17	Water Quality .....	2-32
2.5.18	Aquatic Sediments and Dredging .....	2-33
2.5.19	Wetlands .....	2-34
	2.5.19.1 No Action Alternative .....	2-34
	2.5.19.2 Bayport Terminal Location Alternative .....	2-34

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	2.5.19.3 Other Terminal Location Alternatives .....	2-34
2.5.20	Ecology .....	2-35
	2.5.20.1 No Action Alternative .....	2-35
	2.5.20.2 Bayport Terminal Location Alternative.....	2-35
	2.5.20.3 Other Terminal Location Alternatives .....	2-35
2.5.21	Essential Fish Habitat .....	2-35
<b>3.0</b>	<b>AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES .....</b>	<b>3.1-1</b>
3.1	INTRODUCTION.....	3.1-1
3.2	LAND USE AND COASTAL ZONE MANAGEMENT.....	3.2-1
3.2.1	Introduction .....	3.2-1
3.2.2	Affected Environment .....	3.2-1
	3.2.2.1 Land Use.....	3.2-1
	3.2.2.2 Coastal Zone Management .....	3.2-5
3.2.3	Environmental Consequences.....	3.2-7
	3.2.3.1 Assumptions and Methodologies.....	3.2-7
	3.2.3.2 No Action Alternative .....	3.2-1
	3.2.3.3 The Bayport Terminal Location Alternative .....	3.2-11
	3.2.3.4 Spilmans Island Terminal Location Alternative.....	3.2-13
	3.2.3.5 Shoal Point Terminal Location Alternative.....	3.2-14
	3.2.3.6 Cedar Point Terminal Location Alternative .....	3.2-14
	3.2.3.7 Pelican Island Terminal Location Alternative.....	3.2-15
	3.2.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.2-16
	3.2.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.2-16
	3.2.3.10 Summary.....	3.2-17
3.3	SOCIOECONOMICS .....	3.3-1
3.3.1	Introduction .....	3.3-1
3.3.2	Affected Environment .....	3.3-1
	3.3.2.1 The Three-County Area .....	3.3-4
	3.3.2.2 Chambers County .....	3.3-6
	3.3.2.3 Galveston County .....	3.3-6
	3.3.2.4 Harris County .....	3.3-7
	3.3.2.5 Economic Impacts of the Port of Houston as of 2000 .....	3.3-8
3.3.3	Environmental Consequences.....	3.3-12
	3.3.3.1 Assumptions and Methodologies.....	3.3-12
	3.3.3.2 No Action Alternative .....	3.3-12
	3.3.3.3 Bayport Terminal Location Alternative.....	3.3-16
	3.3.3.4 Spilmans Island Terminal Location Alternative.....	3.3-19
	3.3.3.5 Shoal Point Terminal Location Alternative.....	3.3-20
	3.3.3.6 Cedar Point Terminal Location Alternative .....	3.3-20
	3.3.3.7 Pelican Island Terminal Location Alternative.....	3.3-21
	3.3.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.3-21

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	3.3.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.3-22
	3.3.3.10 Summary .....	3.3-22
3.4	SOCIAL CHARACTERISTICS AND ENVIRONMENTAL JUSTICE .....	3.4-1
3.4.1	Introduction .....	3.4-1
3.4.2	Affected Environment .....	3.4-1
	3.4.2.1 Overview .....	3.4-1
	3.4.2.2 Bayport Study Area .....	3.4-4
	3.4.2.3 Spilmans Island Study Area .....	3.4-6
	3.4.2.4 Shoal Point Study Area .....	3.4-7
	3.4.2.5 Cedar Point Study Area .....	3.4-8
	3.4.2.6 Pelican Island Study Area .....	3.4-8
	3.4.2.7 Upper San Jacinto Bay Study Area .....	3.4-9
3.4.3	Environmental Consequences .....	3.4-9
	3.4.3.1 Assumptions and Methodologies .....	3.4-9
	3.4.3.2 No Action Alternative .....	3.4-11
	3.4.3.3 Bayport Terminal Location Alternative .....	3.4-13
	3.4.3.4 Spilmans Island Terminal Location Alternative .....	3.4-16
	3.4.3.5 Shoal Point Terminal Location Alternative .....	3.4-18
	3.4.3.6 Cedar Point Terminal Location Alternative .....	3.4-20
	3.4.3.7 Pelican Island Terminal Location Alternative .....	3.4-22
	3.4.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.4-24
	3.4.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.4-26
	3.4.3.10 Summary .....	3.4-27
3.5	SURFACE TRANSPORTATION .....	3.5-1
3.5.1	Introduction .....	3.5-1
3.5.2	Affected Environment .....	3.5-1
	3.5.2.1 Definitions .....	3.5-1
	3.5.2.2 Planned and Programmed Roadway Improvements .....	3.5-3
	3.5.2.3 Traffic Count Program .....	3.5-4
	3.5.2.4 Existing Roadway Network .....	3.5-5
	3.5.2.5 Existing Conditions Analysis .....	3.5-10
	3.5.2.6 Railroads and Railroad Crossings .....	3.5-10
	3.5.2.7 Accident History .....	3.5-10
3.5.3	Environmental Consequences .....	3.5-11
	3.5.3.1 Assumptions and Methodologies .....	3.5-11
	3.5.3.2 No Action Alternative .....	3.5-13
	3.5.3.3 Bayport Terminal Location Alternative .....	3.5-14
	3.5.3.4 Spilmans Island Terminal Location Alternative .....	3.5-16
	3.5.3.5 Shoal Point Terminal Location Alternative .....	3.5-16
	3.5.3.6 Cedar Point Terminal Location Alternative .....	3.5-17
	3.5.3.7 Pelican Island Terminal Location Alternative .....	3.5-17
	3.5.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.5-18

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	3.5.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.5-19
3.5.4	Summary.....	3.5-19
	3.5.4.1 Level of Service Comparison Between Terminal Location Alternatives .....	3.5-19
	3.5.4.2 Evaluation of Future-Year Capacity Deficiencies and Required Improvements .....	3.5-19
	3.5.4.3 Near Site or Site Related Improvements .....	3.5-20
3.6	COMMUNITY INFRASTRUCTURE AND MUNICIPAL SERVICES .....	3.6-1
	3.6.1 Introduction .....	3.6-1
	3.6.2 Affected Environment .....	3.6-1
	3.6.2.1 Bayport Study Area.....	3.6-1
	3.6.2.2 Spilmans Island Study Area.....	3.6-1
	3.6.2.3 Shoal Point Study Area.....	3.6-1
	3.6.2.4 Cedar Point Study Area .....	3.6-1
	3.6.2.5 Pelican Island Study Area.....	3.6-2
	3.6.2.6 Upper San Jacinto Bay Study Area .....	3.6-2
	3.6.3 Environmental Consequences.....	3.6-2
	3.6.3.1 Assumptions and Methodologies.....	3.6-2
	3.6.3.2 No Action Alternative .....	3.6-3
	3.6.3.3 Bayport Terminal Location Alternative.....	3.6-3
	3.6.3.4 Spilmans Island Terminal Location Alternative.....	3.6-3
	3.6.3.5 Shoal Point Terminal Location Alternative.....	3.6-4
	3.6.3.6 Cedar Point Terminal Location Alternative .....	3.6-4
	3.6.3.7 Pelican Island Terminal Location Alternative.....	3.6-4
	3.6.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.6-4
	3.6.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.6-5
	3.6.3.10 Summary.....	3.6-5
3.7	NAVIGATION .....	3.7-1
	3.7.1 Introduction .....	3.7-1
	3.7.2 Affected Environment .....	3.7-1
	3.7.2.1 Baywide Navigation Activity .....	3.7-1
	3.7.2.2 Bayport Study Area.....	3.7-2
	3.7.2.3 Spilmans Island Study Area.....	3.7-2
	3.7.2.4 Shoal Point Study Area.....	3.7-3
	3.7.2.5 Cedar Point Study Area .....	3.7-3
	3.7.2.6 Pelican Island Study Area.....	3.7-3
	3.7.2.7 Upper San Jacinto Bay Study Area .....	3.7-3
	3.7.3 Environmental Consequences.....	3.7-3
	3.7.3.1 Assumptions and Methodologies.....	3.7-3
	3.7.3.2 No Action Alternative .....	3.7-5
	3.7.3.3 Bayport Terminal Location Alternative.....	3.7-6
	3.7.3.4 Spilmans Island Terminal Location Alternative.....	3.7-7
	3.7.3.5 Shoal Point Terminal Location Alternative.....	3.7-8

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	3.7.3.6 Cedar Point Terminal Location Alternative .....	3.7-8
	3.7.3.7 Pelican Island Terminal Location Alternative.....	3.7-9
	3.7.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.7-9
	3.7.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.7-11
	3.7.3.10 Summary.....	3.7-12
3.8	NOISE AND VIBRATION .....	3.8-1
3.8.1	Introduction .....	3.8-1
	3.8.1.1 Fundamentals of Acoustics and Vibration .....	3.8-1
	3.8.1.2 Regulatory Environment .....	3.8-4
	3.8.1.3 Sound Level and Vibration Measurements.....	3.8-5
3.8.2	Affected Environment .....	3.8-6
	3.8.2.1 Bayport Study Area.....	3.8-6
	3.8.2.2 Spilmans Island Study Area.....	3.8-10
	3.8.2.3 Shoal Point Study Area.....	3.8-11
	3.8.2.4 Cedar Point Study Area .....	3.8-11
	3.8.2.5 Pelican Island Study Area.....	3.8-12
	3.8.2.6 Upper San Jacinto Bay Study Area .....	3.8-13
3.8.3	Environmental Consequences.....	3.8-13
	3.8.3.1 Assumptions and Methodologies.....	3.8-13
	3.8.3.2 No Action Alternative .....	3.8-24
	3.8.3.3 Bayport Terminal Location Alternative.....	3.8-25
	3.8.3.4 Spilmans Island Terminal Location Alternative.....	3.8-35
	3.8.3.5 Shoal Point Terminal Location Alternative.....	3.8-38
	3.8.3.6 Cedar Point Terminal Location Alternative .....	3.8-41
	3.8.3.7 Pelican Island Terminal Location Alternative.....	3.8-44
	3.8.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.8-47
	3.8.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.8-52
	3.8.3.10 Summary.....	3.8-57
3.9	AESTHETICS AND LIGHT .....	3.9-1
3.9.1	Introduction .....	3.9-1
3.9.2	Affected Environment .....	3.9-1
	3.9.2.1 Bayport Study Area.....	3.9-2
	3.9.2.2 Spilmans Island Study Area.....	3.9-2
	3.9.2.3 Shoal Point Study Area.....	3.9-3
	3.9.2.4 Cedar Point Study Area .....	3.9-4
	3.9.2.5 Pelican Island Study Area.....	3.9-4
	3.9.2.6 Upper San Jacinto Bay Study Area .....	3.9-5
3.9.3	Environmental Consequences.....	3.9-6
	3.9.3.1 Assumptions and Methodologies.....	3.9-6
	3.9.3.2 No Action Alternative .....	3.9-6
	3.9.3.3 Bayport Terminal Location Alternative.....	3.9-6
	3.9.3.4 Spilmans Island Terminal Location Alternative.....	3.9-9
	3.9.3.5 Shoal Point Terminal Location Alternative.....	3.9-9

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	3.9.3.6 Cedar Point Terminal Location Alternative .....	3.9-10
	3.9.3.7 Pelican Island Terminal Location Alternative.....	3.9-10
	3.9.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.9-11
	3.9.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.9-11
	3.9.3.10 Summary.....	3.9-12
3.10	CULTURAL RESOURCES .....	3.10-1
3.10.1	Introduction .....	3.10-1
3.10.2	Affected Environment .....	3.10-1
	3.10.2.1 Bayport Study Area.....	3.10-3
	3.10.2.2 Spilmans Island Study Area.....	3.10-3
	3.10.2.3 Shoal Point Study Area.....	3.10-3
	3.10.2.4 Cedar Point Study Area .....	3.10-3
	3.10.2.5 Pelican Island Study Area.....	3.10-3
	3.10.2.6 Upper San Jacinto Bay Study Area .....	3.10-4
3.10.3	Environmental Consequences.....	3.10-4
	3.10.3.1 Assumptions and Methodologies.....	3.10-4
	3.10.3.2 No Action Alternative .....	3.10-5
	3.10.3.3 Bayport Terminal Location Alternative.....	3.10-5
	3.10.3.4 Spilmans Island Terminal Location Alternative.....	3.10-6
	3.10.3.5 Shoal Point Terminal Location Alternative.....	3.10-7
	3.10.3.6 Cedar Point Terminal Location Alternative .....	3.10-8
	3.10.3.7 Pelican Island Terminal Location Alternative.....	3.10-9
	3.10.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.10-10
	3.10.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.10-10
	3.10.3.10 Summary.....	3.10-11
3.11	PARKS AND RECREATION.....	3.11-1
3.11.1	Introduction .....	3.11-1
3.11.2	Affected Environment .....	3.11-1
	3.11.2.1 Baywide Recreational Activity.....	3.11-1
	3.11.2.2 Bayport Study Area.....	3.11-2
	3.11.2.3 Spilmans Island Study Area.....	3.11-3
	3.11.2.4 Shoal Point Study Area.....	3.11-3
	3.11.2.5 Cedar Point Study Area .....	3.11-3
	3.11.2.6 Pelican Island Study Area.....	3.11-3
	3.11.2.7 Upper San Jacinto Bay Study Area .....	3.11-4
3.11.3	Environmental Consequences.....	3.11-4
	3.11.3.1 Assumptions and Methodologies.....	3.11-4
	3.11.3.2 No Action Alternative .....	3.11-4
	3.11.3.3 Bayport Terminal Location Alternative.....	3.11-5
	3.11.3.4 Spilmans Island Terminal Location Alternative.....	3.11-5
	3.11.3.5 Shoal Point Terminal Location Alternative.....	3.11-5
	3.11.3.6 Cedar Point Terminal Location Alternative .....	3.11-5
	3.11.3.7 Pelican Island Terminal Location Alternative.....	3.11-5

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	3.11.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.11-6
	3.11.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.11-6
	3.11.3.10 Summary .....	3.11-6
3.12	AIR QUALITY .....	3.12-1
3.12.1	Introduction .....	3.12-1
3.12.2	Affected Environment .....	3.12-1
3.12.2.1	Ambient Air Monitoring .....	3.12-1
3.12.2.2	Site-Specific Environmental Description .....	3.12-3
3.12.3	Environmental Consequences .....	3.12-7
3.12.3.1	Assumptions and Methodologies .....	3.12-7
3.12.3.2	No Action Alternative .....	3.12-16
3.12.3.3	Bayport Terminal Location Alternative .....	3.12-17
3.12.3.4	Spilmans Island Terminal Location Alternative .....	3.12-21
3.12.3.5	Shoal Point Terminal Location Alternative .....	3.12-22
3.12.3.6	Cedar Point Terminal Location Alternative .....	3.12-23
3.12.3.7	Pelican Island Terminal Location Alternative .....	3.12-24
3.12.3.8	Shoal Point/Bayport Terminal Location Alternative .....	3.12-25
3.12.3.9	Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.12-26
3.12.3.10	Summary .....	3.12-27
3.13	PUBLIC SAFETY .....	3.13-1
3.13.1	Introduction .....	3.13-1
3.13.1.1	Hazardous Materials Transport .....	3.13-1
3.13.1.2	Railroads .....	3.13-2
3.13.2	Affected Environment .....	3.13-4
3.13.2.1	Fire Protection, Law Enforcement, and Emergency Medical Services .....	3.13-4
3.13.2.2	Hurricane Evacuation .....	3.13-4
3.13.2.3	Truck Safety .....	3.13-5
3.13.2.4	Homeland Security .....	3.13-5
3.13.2.5	Hazardous Material Spills .....	3.13-9
3.13.2.6	Bayport Study Area .....	3.13-9
3.13.2.7	Spilmans Island Study Area .....	3.13-11
3.13.2.8	Shoal Point Study Area .....	3.13-12
3.13.2.9	Cedar Point Study Area .....	3.13-13
3.13.2.10	Pelican Island Study Area .....	3.13-14
3.13.2.11	Upper San Jacinto Bay Study Area .....	3.13-15
3.13.3	Environmental Consequences .....	3.13-16
3.13.3.1	Assumptions and Methodologies .....	3.13-16
3.13.3.2	No Action Alternative .....	3.13-16
3.13.3.3	Bayport Terminal Location Alternative .....	3.13-17
3.13.3.4	Spilmans Island Terminal Location Alternative .....	3.13-19
3.13.3.5	Shoal Point Terminal Location Alternative .....	3.13-20
3.13.3.6	Cedar Point Terminal Location Alternative .....	3.13-21



## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	3.13.3.7 Pelican Island Terminal Location Alternative.....	3.13-22
	3.13.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.13-23
	3.13.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.13-24
	3.13.3.10 Summary.....	3.13-25
3.14	HAZARDOUS MATERIALS, HAZARDOUS WASTES, AND OTHER REGULATED SUBSTANCES.....	3.14-1
3.14.1	Introduction .....	3.14-1
3.14.1.1	Regulations .....	3.14-1
3.14.1.2	Intent of Regulations .....	3.14-1
3.14.1.3	Handling and Transport of Hazardous Materials .....	3.14-2
3.14.1.4	Generation, Storage, and Disposal of Hazardous Wastes .....	3.14-3
3.14.2	Affected Environment .....	3.14-4
3.14.2.1	Bayport Study Area.....	3.14-4
3.14.2.2	Spilmans Island Study Area.....	3.14-4
3.14.2.3	Shoal Point Study Area.....	3.14-5
3.14.2.4	Cedar Point Study Area .....	3.14-5
3.14.2.5	Pelican Island Study Area.....	3.14-5
3.14.2.6	Upper San Jacinto Bay Study Area .....	3.14-5
3.14.3	Environmental Consequences.....	3.14-5
3.14.3.1	Assumptions and Methodologies.....	3.14-5
3.14.3.2	No Action Alternative .....	3.14-6
3.14.3.3	Bayport Terminal Location Alternative.....	3.14-6
3.14.3.4	Spilmans Island Terminal Location Alternative.....	3.14-6
3.14.3.5	Shoal Point Terminal Location Alternative.....	3.14-7
3.14.3.6	Cedar Point Terminal Location Alternative .....	3.14-7
3.14.3.7	Pelican Island Terminal Location Alternative.....	3.14-7
3.14.3.8	Shoal Point/Bayport Terminal Location Alternative .....	3.14-8
3.14.3.9	Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.14-8
3.14.3.10	Mitigation Common to All Alternatives.....	3.14-9
3.14.3.11	Summary.....	3.14-10
3.15	SHORELINE EROSION.....	3.15-1
3.15.1	Introduction .....	3.15-1
3.15.1.1	Erosion Processes .....	3.15-1
3.15.1.2	Applicable Management Programs, Rules, and Regulations .....	3.15-1
3.15.2	Affected Environment .....	3.15-2
3.15.2.1	Bayport Study Area.....	3.15-2
3.15.2.2	Spilmans Island Study Area.....	3.15-3
3.15.2.3	Shoal Point Study Area.....	3.15-4
3.15.2.4	Cedar Point Study Area .....	3.15-4
3.15.2.5	Pelican Island Study Area.....	3.15-5
3.15.2.6	Upper San Jacinto Bay Study Area .....	3.15-5
3.15.3	Environmental Consequences.....	3.15-6
3.15.3.1	Assumptions and Methodologies.....	3.15-6

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	3.15.3.2 No Action Alternative .....	3.15-7
	3.15.3.3 Bayport Terminal Location Alternative.....	3.15-7
	3.15.3.4 Spilmans Island Terminal Location Alternative.....	3.15-8
	3.15.3.5 Shoal Point Terminal Location Alternative.....	3.15-8
	3.15.3.6 Cedar Point Terminal Location Alternative .....	3.15-9
	3.15.3.7 Pelican Island Terminal Location Alternative.....	3.15-10
	3.15.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.15-10
	3.15.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.15-11
	3.15.3.10 Summary.....	3.15-12
3.16	HYDROLOGY, DRAINAGE, AND FLOODING.....	3.16-1
3.16.1	Regulatory Framework .....	3.16-1
3.16.2	Affected Environment .....	3.16-4
	3.16.2.1 Climatology .....	3.16-4
	3.16.2.2 Regional Water Bodies .....	3.16-5
	3.16.2.3 The Galveston Bay Watershed.....	3.16-8
	3.16.2.4 Bayport Study Area.....	3.16-9
	3.16.2.5 Spilmans Island Study Area.....	3.16-10
	3.16.2.6 Shoal Point Study Area.....	3.16-11
	3.16.2.7 Cedar Point Study Area .....	3.16-11
	3.16.2.8 Pelican Island Study Area.....	3.16-12
	3.16.2.9 Upper San Jacinto Bay Study Area .....	3.16-13
3.16.3	Environmental Consequences.....	3.16-13
	3.16.3.1 Assumptions and Methodologies.....	3.16-13
	3.16.3.2 No Action Alternative .....	3.16-14
	3.16.3.3 Bayport Terminal Location Alternative.....	3.16-14
	3.16.3.4 Spilmans Island Terminal Location Alternative.....	3.16-18
	3.16.3.5 Shoal Point Terminal Location Alternative.....	3.16-19
	3.16.3.6 Cedar Point Terminal Location Alternative .....	3.16-21
	3.16.3.7 Pelican Island Terminal Location Alternative.....	3.16-23
	3.16.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.16-25
	3.16.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.16-26
	3.16.3.10 Summary.....	3.16-28
3.17	WATER QUALITY.....	3.17-1
3.17.1	Introduction and Regulatory Framework .....	3.17-1
	3.17.1.1 Federal Regulations.....	3.17-1
	3.17.1.2 State Regulations .....	3.17-3
3.17.2	Affected Environment .....	3.17-13
	3.17.2.1 Data Collection.....	3.17-13
	3.17.2.2 Regional Surface Water Quality .....	3.17-15
	3.17.2.3 Regional Groundwater Quality.....	3.17-22
	3.17.2.4 Bayport Study Area.....	3.17-23
	3.17.2.5 Spilmans Island Study Area.....	3.17-27
	3.17.2.6 Shoal Point Study Area.....	3.17-30

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>		<u>Page</u>
	3.17.2.7 Cedar Point Study Area .....	3.17-33
	3.17.2.8 Pelican Island Study Area .....	3.17-36
	3.17.2.9 Upper San Jacinto Bay Study Area .....	3.17-38
3.17.3	Environmental Consequences .....	3.17-41
	3.17.3.1 Assumptions and Methodologies .....	3.17-41
	3.17.3.2 No Action Alternative .....	3.17-41
	3.17.3.3 Bayport Terminal Location Alternative .....	3.17-42
	3.17.3.4 Spilmans Island Terminal Location Alternative .....	3.17-47
	3.17.3.5 Shoal Point Terminal Location Alternative .....	3.17-48
	3.17.3.6 Cedar Point Terminal Location Alternative .....	3.17-49
	3.17.3.7 Pelican Island Terminal Location Alternative .....	3.17-50
	3.17.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.17-51
	3.17.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.17-53
	3.17.3.10 Summary .....	3.17-55
3.18	SEDIMENTS AND DREDGED MATERIAL PLACEMENT .....	3.18-1
	3.18.1 Introduction .....	3.18-1
	3.18.1.1 Regulatory Framework .....	3.18-2
	3.18.2 Affected Environment .....	3.18-4
	3.18.2.1 Data Collection .....	3.18-4
	3.18.2.2 Bayport Study Area .....	3.18-9
	3.18.2.3 Spilmans Island Study Area .....	3.18-10
	3.18.2.4 Shoal Point Study Area .....	3.18-12
	3.18.2.5 Cedar Point Study Area .....	3.18-13
	3.18.2.6 Pelican Island Study Area .....	3.18-14
	3.18.2.7 Upper San Jacinto Bay Study Area .....	3.18-16
	3.18.3 Environmental Consequences .....	3.18-17
	3.18.3.1 Assumptions and Methodologies .....	3.18-17
	3.18.3.2 No Action Alternative .....	3.18-20
	3.18.3.3 Bayport Terminal Location Alternative .....	3.18-20
	3.18.3.4 Spilmans Island Terminal Location Alternative .....	3.18-22
	3.18.3.5 Shoal Point Terminal Location Alternative .....	3.18-24
	3.18.3.6 Cedar Point Terminal Location Alternative .....	3.18-25
	3.18.3.7 Pelican Island Terminal Location Alternative .....	3.18-26
	3.18.3.8 Shoal Point/Bayport Terminal Location Alternative .....	3.18-27
	3.18.3.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.18-28
	3.18.3.10 Summary .....	3.18-29
3.19	WETLANDS .....	3.19-1
	3.19.1 Regulation of Activities in Wetlands .....	3.19-1
	3.19.2 Affected Environment .....	3.19-3
	3.19.2.1 Wetland Indicators .....	3.19-3
	3.19.2.2 National Wetlands Inventory .....	3.19-5
	3.19.2.3 Methods Used to Estimate Wetland Acreage .....	3.19-6
	3.19.2.4 Wetland Estimates .....	3.19-7

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Page</u>
3.19.3 Environmental Consequences.....	3.19-13
3.19.3.1 No Action Alternative .....	3.19-13
3.19.3.2 Bayport Terminal Location Alternative.....	3.19-14
3.19.3.3 Spilmans Island Terminal Location Alternative.....	3.19-14
3.19.3.4 Shoal Point Terminal Location Alternative.....	3.19-14
3.19.3.5 Cedar Point Terminal Location Alternative .....	3.19-14
3.19.3.6 Pelican Island Terminal Location Alternative.....	3.19-15
3.19.3.7 Shoal Point/Bayport Terminal Location Alternative .....	3.19-15
3.19.3.8 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.19-15
3.19.3.9 Proposed Mitigation Measures .....	3.19-16
3.19.3.10 Summary.....	3.19-19
3.20 ECOLOGY .....	3.20-1
3.20.1 Regulatory Framework .....	3.20-1
3.20.1.1 Federal Regulations.....	3.20-1
3.20.1.2 State Regulations .....	3.20-6
3.20.2 Affected Environment .....	3.20-6
3.20.2.1 Biotic Communities .....	3.20-6
3.20.2.2 Protected Species.....	3.20-16
3.20.2.3 Nonindigenous Species .....	3.20-24
3.20.3 Specific Conditions at Study Areas .....	3.20-26
3.20.3.1 Bayport Study Area.....	3.20-26
3.20.3.2 Spilmans Island Study Area.....	3.20-34
3.20.3.3 Shoal Point Study Area.....	3.20-36
3.20.3.4 Cedar Point Study Area .....	3.20-39
3.20.3.5 Pelican Island Study Area.....	3.20-42
3.20.3.6 Shoal Point/Bayport Study Area .....	3.20-44
3.20.3.7 Upper San Jacinto Bay/Bayport Study Area.....	3.20-45
3.20.4 Environmental Consequences.....	3.20-47
3.20.4.1 Assumptions and Methodologies.....	3.20-47
3.20.4.2 No Action Alternative .....	3.20-48
3.20.4.3 Bayport Terminal Location Alternative.....	3.20-49
3.20.4.4 Spilmans Island Terminal Location Alternative.....	3.20-53
3.20.4.5 Shoal Point Terminal Location Alternative.....	3.20-56
3.20.4.6 Cedar Point Terminal Location Alternative .....	3.20-59
3.20.4.7 Pelican Island Terminal Location Alternative.....	3.20-62
3.20.4.8 Shoal Point/Bayport Terminal Location Alternative .....	3.20-65
3.20.4.9 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.20-67
3.20.4.10 Proposed and Potential Mitigation Measures .....	3.20-69
3.20.4.11 Summary.....	3.20-76
3.21 ESSENTIAL FISH HABITAT .....	3.21-1
3.21.1 Regulatory Framework .....	3.21-1
3.21.1.1 Federal Regulations.....	3.21-1
3.21.2 Affected Environment .....	3.21-2

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Page</u>
3.21.2.1 Essential Fish Habitat in Galveston Bay .....	3.21-2
3.21.2.2 Specific Conditions at Study Areas .....	3.21-3
3.21.3 Environmental Consequences .....	3.21-3
3.21.3.1 No Action Alternative .....	3.21-3
3.21.3.2 Bayport Terminal Location Alternative .....	3.21-4
3.21.3.3 Spilmans Island Terminal Location Alternative .....	3.21-7
3.21.3.4 Shoal Point Terminal Location Alternative .....	3.21-7
3.21.3.5 Cedar Point Terminal Location Alternative .....	3.21-7
3.21.3.6 Pelican Island Terminal Location Alternative .....	3.21-8
3.21.3.7 Shoal Point/Bayport Terminal Location Alternative .....	3.21-8
3.21.3.8 Upper San Jacinto Bay/Bayport Terminal Location Alternative .....	3.21-9
3.21.3.9 Proposed and Potential Mitigation Measures .....	3.21-9
<b>4.0 MITIGATION SUMMARY, UNAVOIDABLE IMPACTS, AND LONG-TERM AND CUMULATIVE EFFECTS .....</b>	<b>4-1</b>
4.1 INTRODUCTION .....	4-1
4.2 APPLICANT'S PROPOSED PROGRAM OF MITIGATION FEATURES AND ACTIVITIES .....	4-1
4.2.1 Buffer Zone and 20-Foot Berm .....	4-1
4.2.2 Seventy-Five-Foot Set-Aside .....	4-2
4.2.3 Channel Setback .....	4-2
4.2.4 North Shore Slope Protection .....	4-2
4.2.5 Beneficial Use of Dredged Material .....	4-2
4.2.6 Cruise Terminal Modification .....	4-3
4.2.7 Pre-Entry Gate Relocation .....	4-3
4.2.8 Wetland Property Acquisition and Mitigation .....	4-3
4.2.9 Stormwater Management and Treatment .....	4-3
4.2.9.1 First Flush .....	4-3
4.2.9.2 South Terminal Retention Pond .....	4-4
4.2.9.3 Inlet Treatment Units and High Area Impact Treatment .....	4-4
4.2.10 Alternate Fuel for Vehicles and Equipment .....	4-4
4.2.11 Onsite Fire/Hazmat and Police .....	4-4
4.2.12 Lighting .....	4-4
4.2.13 Cruise Road .....	4-5
4.2.14 Todville/Port Road Intersection .....	4-5
4.2.15 Environmental Management System .....	4-5
4.2.16 Stormwater Pollution Prevention Plan/Construction Best Management Practices .....	4-5
4.2.17 Waste Minimization .....	4-5
4.2.18 Leaking Container Station .....	4-5
4.2.19 Drilled Shaft vs. Piles .....	4-6
4.2.20 Tangent Pier vs. Sheetpile Construction .....	4-6
4.2.21 North Shore Noise Wall .....	4-6
4.2.22 Spreader Bars .....	4-6

## VOLUME II

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Page</u>
4.2.23 Port-Wide Commitments.....	4-6
4.3 UNAVOIDABLE ADVERSE IMPACTS OF THE PROPOSED PROJECT.....	4-7
4.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES FROM THE PROPOSED PROJECT .....	4-8
4.4 RELATIONSHIP OF SHORT-TERM USES OF MAN'S ENVIRONMENT AND LONG-TERM PRODUCTIVITY .....	4-9
4.6 CUMULATIVE EFFECTS.....	4-10
4.6.1 Potential Cumulative Effects Issues Addressed in this EIS.....	4-11
4.6.2 Cumulative Effects Assessment Methodology .....	4-11
4.6.3 Geographic Boundaries and Time Frames.....	4-11
4.6.4 Magnitude and Significance of Cumulative Effects .....	4-12
4.6.5 Identification of Present and Future Actions.....	4-12
4.6.6 Results of Cumulative Effects Assessment .....	4-15
4.6.6.1 Introduction .....	4-15
4.6.6.2 Land Use and Coastal Zone Management.....	4-15
4.6.6.3 Socioeconomic Environment, Social Characteristics and Environmental Justice.....	4-17
4.6.6.4 Surface Transportation .....	4-17
4.6.6.5 Community Infrastructure and Municipal Services .....	4-19
4.6.6.6 Navigation .....	4-19
4.6.6.7 Noise .....	4-20
4.6.6.8 Aesthetics and Light .....	4-20
4.6.6.9 Cultural Resources .....	4-20
4.6.6.10 Parks and Recreation .....	4-20
4.6.6.11 Air Quality .....	4-20
4.6.6.12 Public Safety.....	4-23
4.6.6.13 Hazardous Materials.....	4-24
4.6.6.14 Shoreline Erosion .....	4-24
4.6.6.15 Hydrology, Drainage, and Floodplains .....	4-24
4.6.6.16 Water Quality .....	4-24
4.6.6.17 Sediments and Dredged Material Placement.....	4-27
4.6.6.18 Wetlands .....	4-28
4.6.6.19 Ecology .....	4-30
4.7 COMPARISON OF POTENTIAL CUMULATIVE EFFECTS.....	4-31
<b>5.0 LIST OF PREPARERS AND REVIEWERS .....</b>	<b>5-1</b>
<b>6.0 CONSULTATION AND COORDINATION .....</b>	<b>6-1</b>
6.1 INTRODUCTION.....	6-1
6.2 SCOPING.....	6-1
6.2.1 Scoping Process.....	6-1
6.2.2 Issues Raised During the Scoping Process .....	6-2

VOLUME II

PROPOSED BAYPORT TERMINAL  
ENVIRONMENTAL IMPACT STATEMENT

TABLE OF CONTENTS  
(Continued)

<u>Section</u>	<u>Page</u>
6.3 COMMUNITY OUTREACH.....	6-4
6.3.1 Meetings .....	6-4
6.3.2 Newsletters .....	6-7
6.4 PUBLIC HEARING.....	6-7
6.5 PUBLIC COMMENTS .....	6-8
6.6 RECIPIENTS.....	6-9
7.0 BIBLIOGRAPHY.....	7-1
8.0 INDEX .....	8-1

## **VOLUME III**

### **PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT**

#### **LIST OF TABLES**

##### **Table**

2-1	Tier 2 Evaluation of Potential Terminal Location Alternatives
2-2	Tier 3 Evaluation of Terminal Location Alternatives
2-3	Acreage of Dredge and Fill
2-4	Summary Comparison of Environmental Consequences
3.2-1	Summary of Land Use Definitions and Categories
3.2-2	Historic Land Use Distribution 1962-2000 Barbours Cut Container Terminal
3.2-3	Historic Land Use Distribution 1944-2000 Bayport Alternative Site
3.2-4	Adverse Effect Potential to Coastal Natural Resource Areas, by Location
3.2-5	Summary of Land Use Impacts
3.3-1	Population and Employment for the Three-County Area, 1980 to 2030
3.3-2	Total Employment by Major Economic Sectors for the Three-County Area, 1980 to 2030
3.3-3	Location Quotients for Chambers, Galveston, and Harris Counties and the Three-County Area, Comparison with the State of Texas, 1990 and 2000
3.3-4	Location Quotients for Chambers, Galveston, and Harris Counties and the Three-County Area, Comparison with the Southwest Region, 1990 and 2000
3.3-5	Population and Employment for Chambers County, 1980 to 2030
3.3-6	Total Employment by Major Economic Sectors for Chambers County, 1980 to 2030
3.3-7	Top Twenty Major Employers in Chambers County, March 2001
3.3-8	Chambers County Civilian Labor Force Annual Average Estimates and Unemployment Rates, 1990 to 2001
3.3-9	Civilian Labor Force Characteristics for Chambers, Galveston, and Harris Counties by Race and Sex, July 2000
3.3-10	Population and Employment for Galveston County, 1980 to 2030
3.3-11	Total Employment by Major Economic Sectors for Galveston County, 1980 to 2030
3.3-12	Major Employers in Galveston County, 2001
3.3-13	Galveston County Civilian Labor Force Annual Average Estimates and Unemployment Rates, 1990 to 2001
3.3-14	Population and Employment for Harris County, 1980 to 2030
3.3-15	Total Employment by Major Economic Sectors for Harris County, 1980 to 2030
3.3-16	Major Employers in Harris County, 1999
3.3-17	Harris County Civilian Labor Force Annual Average Estimates and Unemployment Rates, 1990 to 2001
3.3-18	Summary of the Economic Impacts Generated by the Applicant-Owned and Private Marine Terminals, 2000
3.3-19	Direct Jobs by Category Generated by Cargo at Applicant-Owned and Private Marine Terminals, 2000



## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.3-20	Distribution of Induced Jobs Generated by the Applicant-Owned and Private Marine Terminals, 2000
3.3-21	Commodity Tonnage for the Applicant-Owned Terminals, 2000
3.3-22	Applicant's Barbour Cut Cruise Operations Sailings and Passengers, 1997 to 2000
3.3-23	Summary of the No Action Alternative Economic Impact Projections of Applicant-Owned and Private Marine Terminal Operations, 2030
3.3-24	Summary of the No Action Alternative Economic Impact Projections of Applicant-Owned and Private Marine Terminal Operations, 2000 to 2030
3.3-25	The No Action Alternative Economic Impact Projections of Applicant-Owned and Private Marine Cargo Operations, 2000 to 2030
3.3-26	The No Action Alternative Distribution of the Total Marine Cargo Direct Jobs for the Applicant-Owned and Private Marine Facilities, 2000 to 2030
3.3-27	The No Action Alternative Economic Impact Projections of the Applicant's Cruise Operations, 2000 to 2030
3.3-28	Summary of the Total Economic Impact Projections for the Applicant-Owned (Including the Terminal Location Alternative) and Private Marine Facilities Operations, 2030
3.3-29	Summary of the Total Economic Impact Projections of Applicant-Owned (Including the Terminal Location Alternative) and Private Marine Terminal Operations, 2000 to 2030
3.3-30	The Terminal Location Alternatives Economic Impact Projections for the Applicant-Owned and Private Terminal Cargo Operations, 2000 to 2030
3.3-31	Distribution of the Total Marine Cargo Direct Jobs for the Applicant-Owned (Including the Terminal Location Alternative) and the Private Marine Facilities, 2000 to 2030
3.3-32	The Total Economic Impact Projections of Cruise Operations for the Terminal Location Alternatives, 2005 to 2030
3.3-33	Net Increase of Total Economic Impacts Attributed to the Cargo and Cruise Operations of the Terminal Location Alternatives, 2005 to 2030
3.3-34	Net Distribution of Direct Jobs Created by the Container Operations of the Terminal Location Alternatives, 2000 to 2030
3.3-35	Projected Economic Impacts Resulting from the Construction of the Terminal Location Alternatives
3.3-36	Geographic Distribution of the Total Net Employment Increase Attributed to the Terminal Location Alternatives, 2030
3.4-1	Population Growth Trends for Chambers, Galveston, and Harris Counties and the Three-County Area, 1980 to 2000
3.4-2	2000 United States Census Population and Estimated Population for 1995 and 2000 By Race and Ethnicity for Chambers, Galveston, and Harris Counties and the Three-County Area

## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

#### Table

3.4-3	2000 Racial and Ethnicity Characteristics of Chambers, Galveston, and Harris Counties and the Three-County Area
3.4-4	2000 Income Distribution for Chambers, Galveston, and Harris Counties and the Three-County Area
3.4-5	2000 Employment and Journey to Work Characteristics for Chambers, Galveston, and Harris Counties and the Three-County Area
3.4-6	1990 and 2000 Population Estimates for Study Areas, City and Towns
3.4-7	Bayport Study Area 2000 Racial and Ethnic Composition
3.4-8	Bayport Study Area 1999 Household Income Distribution
3.4-9	Bayport Study Area 2000 Employment and Journey to Work Characteristics
3.4-10	Comparison of Average Property Values for Selected Cities and Harris County, 1988-2000
3.4-11	Comparison of Average Property Values for Morgans Point, Selected La Porte Area Subdivisions, Bay Colony Subdivision, Cities in Harris County, and Harris County, 1988-2000
3.4-12	MLS Data for El Jardin, Shoreacres, and the Bay Colony Subdivision, 1996-2000
3.4-13	Spilmans Island Study Area 2000 Racial and Ethnic Composition
3.4-14	Spilmans Island Study Area 1999 Household Income Distribution
3.4-15	Spilmans Island Study Area 2000 Employment and Journey to Work Characteristics
3.4-16	Comparison of Average Property Values for the La Porte Area Subdivisions with Constant Number of Single-Family Residential Properties Between 1988 and 2000
3.4-17	Shoal Point Study Area 2000 Racial and Ethnic Composition
3.4-18	Shoal Point Study Area 1999 Household Income Distribution
3.4-19	Shoal Point Study Area 2000 Employment and Journey to Work Characteristics
3.4-20	Cedar Point Study Area 2000 Race and Ethnic Composition
3.4-21	Cedar Point Study Area 1999 Household Income Distribution
3.4-22	Cedar Point Study Area 2000 Employment and Journey to Work Characteristics
3.4-23	2000 Census Racial and Ethnic Characteristics for the Texas A&M University at Galveston Dormitories
3.4-24	Racial and Ethnic Characteristics of Student Enrollment at Texas A&M University at Galveston, Fall 1999 and Spring 2000
3.4-25	Upper San Jacinto Bay Study Area 2000 Racial and Ethnic Composition
3.4-26	No Action Alternative Population, Persons Per Household, and Employment Projections for Chambers, Galveston, Harris, and the Three-County Area, 2000 to 2030
3.4-27	No Action Alternative Population Projections by Race and Ethnicity for the Three-County Area, 2000 to 2030
3.4-28	Population Projections by Race and Ethnicity for Chambers, Galveston, and Harris Counties, 2000 to 2030

## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.4-29	No Action Alternative Community Service Need Projections for the Three-County Area, 2000 to 2030
3.4-30	No Action Alternative Community Service Projections for Chambers, Galveston, and Harris Counties, 2000 to 2030
3.4-31	Estimated Relocations and Property Acquisitions Resulting from the Terminal Location Alternatives
3.4-32	Geographic Distribution of the Total Port-Related Net Employment Attributed to the Terminal Location Alternatives Located in Harris County, 2000 to 2030
3.4-33	Geographic Distribution of Employment and Population Growth by County for the Harris County Terminal Location Alternatives, 2000 to 2030
3.4-34	Geographic Distribution of Employment and Population Growth for the Three-County Area for the Harris County Terminal Location Alternatives, 2000 to 2030
3.4-35	Additional Community Services Needed to Serve the Three-County Area Population Increase Resulting from the Terminal Development Alternatives Located in Harris County, 2000 to 2030
3.4-36	Community Services Needed by County to Serve the Additional Population Resulting from the Terminal Location Alternatives Located in Harris County, 2000 to 2030
3.4-37	EPA Region 6 Potential Environmental Justice Index for the Areas Within 1 to 50 Square Miles of the Terminal Development, the Community Study Areas, and 2025 Traffic Study Areas
3.4-38	Geographic Distribution of the Total Net Employment Attributed to the Shoal Point and Pelican Island Terminal Location Alternatives Located in Galveston County, 2000 to 2030
3.4-39	Geographic Distribution of Employment and Population Growth by County for the Shoal Point and Pelican Island Terminal Location Alternatives Located in Galveston County, 2000 to 2030
3.4-40	Geographic Distribution of Employment and Population Growth for the Three-County Area for the Shoal Point and Pelican Island Terminal Location Alternatives Located in Galveston County, 2000 to 2030
3.4-41	Additional Community Services Needed to Serve the Three-County Area Population Increase Resulting from the Terminal Development Alternatives Located in Galveston County, 2000 to 2030
3.4-42	Additional Community Services Needed to Serve the Net Increase in Population Resulting from the Shoal Point and Pelican Island Alternatives Located in Galveston County, 2000 to 2030
3.4-43	Geographic Distribution of the Total Port-Related Net Employment Increase Attributed to the Cedar Point Terminal Location Alternative Located in Chambers County, 2000 to 2030
3.4-44	Geographic Distribution of Employment and Population Growth by County for the Cedar Point Terminal Location Alternative Located in Chambers County, 2000 to 2030

## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.4-45	Geographic Distribution of Employment and Population Growth for the Three-County Area for the Cedar Point Terminal Location Alternative Located in Chambers County, 2000 to 2030
3.4-46	Additional Community Services Needed to Serve the Three-County Area Population Increase Resulting from the Terminal Development Alternatives Located in Chambers County, 2000 to 2030
3.4-47	Community Services Needed to Serve the Additional Population Resulting from the Cedar Point Alternative Located in Chambers County, 2000 to 2030
3.4-48	Geographic Distribution of the Total Port-Related Net Employment Increase Attributed to the Shoal Point/Bayport Terminal Location Alternative Located in Harris and Galveston Counties, 2000 to 2030
3.4-49	Geographic Distribution of Employment and Population Growth by County for the Shoal Point/Bayport Terminal Location Alternative Located in Harris and Galveston Counties, 2000 to 2030
3.4-50	Geographic Distribution of Employment and Population Growth for the Three-County Area for the Shoal Point/Bayport Terminal Location Alternative Located in Harris and Galveston Counties, 2000 to 2030
3.4-51	Additional Community Services Needed to Serve the Three-County Area Population Increase Resulting from the Shoal Point/Bayport Terminal Location Alternative Located in Galveston and Harris Counties, 2000 to 2030
3.4-52	Community Services Needed to Serve the Additional Population Resulting from the Shoal Point/Bayport Alternative Located in Galveston and Harris Counties, 2000 to 2030
3.5-1	Existing Roadways Level of Service Summary
3.5-2	Existing At-Grade Railroad Crossing Data
3.5-3	Accident Summary – Three-Year Period from 1996 to 1998
3.5-4	Traffic Count Summary (Barbours Cut Boulevard and North Broadway Street)
3.5-5	Daily Unit Throughput – June 2000
3.5-6	Main Origins of Containerized Cargo Traveling to Barbours Cut Terminal
3.5-7	Main Destinations of Containerized Cargo Traveling to Barbours Cut Terminal
3.5-8	Year 2005 Level of Service Summary - No Action Alternative
3.5-9	Year 2015 Level of Service Summary - No Action Alternative
3.5-10	Year 2025 Level of Service Summary - No Action Alternative
3.5-11	Year 2005 Level of Service Summary - Bayport Alternative
3.5-12	Year 2015 Level of Service Summary - Bayport Alternative
3.5-13	Year 2025 Level of Service Summary - Bayport Alternative
3.5-14	2005 Traffic Operations for Bayport Study Area Railroad Crossings
3.5-15	2015 Traffic Operations for Bayport Study Area Railroad Crossings
3.5-16	2025 Traffic Operations for Bayport Study Area Railroad Crossings
3.5-17	Year 2005 Level of Service Summary - Spilmans Island Alternative

## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.5-18	Year 2015 Level of Service Summary - Spilmans Island Alternative
3.5-19	Year 2025 Level of Service Summary - Spilmans Island Alternative
3.5-20	2005 Traffic Operations for Spilmans Island Study Area Railroad Crossing
3.5-21	2015 Traffic Operations for Spilmans Island Study Area Railroad Crossing
3.5-22	2025 Traffic Operations for Spilmans Island Study Area Railroad Crossing
3.5-23	Year 2005 Level of Service Summary - Shoal Point Alternative
3.5-24	Year 2015 Level of Service Summary - Shoal Point Alternative
3.5-25	Year 2025 Level of Service Summary - Shoal Point Alternative
3.5-26	2005 Traffic Operations for Shoal Point Study Area Railroad Crossing
3.5-27	2015 Traffic Operations for Shoal Point Study Area Railroad Crossing
3.5-28	2025 Traffic Operations for Shoal Point Study Area Railroad Crossing
3.5-29	Year 2005 Level of Service Summary - Cedar Point Alternative
3.5-30	Year 2015 Level of Service Summary - Cedar Point Alternative
3.5-31	Year 2025 Level of Service Summary - Cedar Point Alternative
3.5-32	2005 Traffic Operations for Cedar Point Study Area Railroad Crossing
3.5-33	2015 Traffic Operations for Cedar Point Study Area Railroad Crossing
3.5-34	2025 Traffic Operations for Cedar Point Study Area Railroad Crossing
3.5-35	Year 2005 Level of Service Summary - Pelican Island Alternative
3.5-36	Year 2015 Level of Service Summary - Pelican Island Alternative
3.5-37	Year 2025 Level of Service Summary - Pelican Island Alternative
3.5-38	Year 2005 Level of Service Summary - Shoal Point/Bayport Alternative
3.5-39	Year 2015 Level of Service Summary - Shoal Point/Bayport Alternative
3.5-40	Year 2025 Level of Service Summary - Shoal Point/Bayport Alternative
3.5-41	2005 Traffic Operations for Shoal Point/Bayport Study Area at Railroad Crossings
3.5-42	2015 Traffic Operations for Shoal Point/Bayport Study Area at Railroad Crossings
3.5-43	2025 Traffic Operations for Shoal Point/Bayport Study Area at Railroad Crossings
3.5-44	Year 2005 Level of Service Summary - Upper San Jacinto Bay/Bayport Alternative
3.5-45	Year 2015 Level of Service Summary - Upper San Jacinto Bay/Bayport Alternative
3.5-46	Year 2025 Level of Service Summary - Upper San Jacinto Bay/Bayport Alternative
3.5-47	2005 Traffic Operations for San Jacinto/Bayport Study Area at Railroad Crossings
3.5-48	2015 Traffic Operations for San Jacinto/Bayport Study Area at Railroad Crossings
3.5-49	2025 Traffic Operations for San Jacinto/Bayport Study Area at Railroad Crossings
3.5-50	2005 Level of Service Comparison - All Alternatives
3.5-51	2015 Level of Service Comparison - All Alternatives
3.5-52	2025 Level of Service Comparison - All Alternatives
3.5-53	Comparative Total of Lane Miles Required per Alternative
3.5-54	Year 2025 Required Roadway Improvements - All Alternatives
3.5-55	Planned Roadway Improvement Projects in Study Area
3.7-1	Ship and Tow Transits in the Study Areas

## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.7-2	Commercial Fishing Permits Issued for the Galveston Bay Area
3.7-3	Marina Facilities
3.7-4	Number of Recreational Boat Permits Registered in the Three-County Area
3.7-5	Projected Bayport Channel Average Weekly Vessel One-Way Transits for the No Action Alternative
3.7-6	Projected Average Weekly Vessel One-Way Transits for the Bayport Terminal Location Alternative
3.7-7	Transit Distance from Galveston Sea Buoy to Turning Basins at Each Terminal Location Alternative
3.7-8	Projected Average Weekly Vessel One-Way Transits for the Spilmans Island Terminal Location Alternative
3.7-9	Projected Average Weekly Vessel One-Way Transits for the Shoal Point Terminal Location Alternative
3.7-10	Projected Average Weekly Vessel One-Way Transits for the Cedar Point Terminal Location Alternative
3.7-11	Projected Average Weekly Vessel One-Way Transits for the Pelican Island Terminal Location Alternative
3.7-12	Projected Average Weekly Vessel One-Way Transits for the Shoal Point/Bayport Terminal Location Alternative
3.7-13	Projected Average Weekly Vessel One-Way Transits for the Upper San Jacinto Bay/Bayport Terminal Location Alternative
3.7-14	Projected One-Way Transits for Container Ships, Cruise Ships, Other Ships, and Tows for Each Terminal Location Alternative for Year 2030
3.8-1	Sound Levels of Typical Noise Sources and Environments (A-Weighted Sound Levels)
3.8-2	Vibration Source Levels for Construction Equipment
3.8-3	Ambient Noise Levels Bayport Terminal Location Alternative – Shoreacres
3.8-4	Ambient Noise Levels Bayport Terminal Location Alternative – El Jardin
3.8-5	Ambient Noise Levels Bayport Terminal Location Alternative – Surf Oaks
3.8-6	Ambient Noise Levels Shoal Point Terminal Location Alternative
3.8-7	Ambient Noise Levels Cedar Point Terminal Location Alternative
3.8-8	Ambient Noise Levels Pelican Island Terminal Location Alternative
3.8-9	Barbours Cut Terminal Noise Monitoring March 28 to 29, 2000 (P1)
3.8-10	Barbours Cut Terminal Noise Monitoring March 29 to 30, 2000 (P2)
3.8-11	Barbours Cut Terminal Noise Monitoring March 30 to 31, 2000 (P3)
3.8-12	Barbours Cut Terminal Noise Monitoring May 31 to June 1, 2000 (P4)
3.8-13	Barbours Cut Terminal Noise Monitoring June 1 to June 2, 2000 (P5)
3.8-14	Barbours Cut Terminal Noise Monitoring October 10, 2001 (P6)
3.8-15	Barbours Cut Terminal Noise Monitoring March 12 and 13, 2002 (P7)

## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.8-16	Barbours Cut Terminal 24 Hour Noise Monitoring March 12, 2002 (P7-F)
3.8-17	Barbours Cut Terminal Spectral Measurements (P7)
3.8-18	Ship Distance From Octave Band Measurement Location
3.8-19	Acoustical Calculations for Bayport Terminal Location Alternative
3.8-20	Calculated Sound Levels
3.8-21	Acoustical Calculations for Spilmans Island Terminal Location Alternative
3.8-22	Acoustical Calculations for Shoal Point Terminal Location Alternative
3.8-23	Acoustical Calculations for Cedar Point Terminal Location Alternative
3.8-24	Acoustical Calculations for Pelican Island Terminal Location Alternative
3.8-25	Acoustical Calculations for Upper San Jacinto Bay/Bayport Terminal Location Alternative
3.10-1	Cultural Resources, No Action Alternative
3.10-2	Cultural Resources, Bayport Terminal Location Alternative
3.10-3	Cultural Resources, Spilmans Island Terminal Location Alternative
3.10-4	Cultural Resources, Shoal Point Terminal Location Alternative
3.10-5	Cultural Resources, Cedar Point Terminal Location Alternative
3.10-6	Cultural Resources, Pelican Island Terminal Location Alternative
3.10-7	Cultural Resources, Upper San Jacinto Bay Terminal Location Alternative
3.11-1	Parks and Open Space Classification Table
3.11-2	Galveston Bay Recreational Usage
3.11-3	Gulf Coast Region Activities Summary
3.11-4	Recreational Properties in the Study Areas
3.12-1	National and Texas Ambient Air Quality Standards
3.12-2	Criteria Pollutants: Maximum Values (By Monitoring Site and Year)
3.12-3	Container and Cruise Terminal Construction Emissions Sources
3.12-4	Container Terminal Operational Emission Sources
3.12-5	Cruise Terminal Operational Emission Sources
3.12-6	No Action Alternative Total Air Quality Emissions
3.12-7	Bayport Related Emissions
3.12-8	Bayport Related Offsite and Onsite Emissions
3.12-9	Bayport Emissions Inventory Comparison To Bayport SIP Budget For NO <sub>x</sub>
3.12-10	Bayport Emissions Inventory Comparison To Bayport SIP Budget for VOC
3.12-11	Bayport Conformity-Related Emissions (NO <sub>x</sub> )
3.12-12	Bayport Estimated CO Ground Level Ambient Concentrations
3.12-13	Estimated 2010 Maximum Ambient Air Pollutant Concentrations
3.12-14	Estimated 2025 Maximum Ambient Air Pollutant Concentrations
3.12-15	Estimated 2010 Maximum Toxic Air Pollutant Concentrations
3.12-16	Estimated 2025 Maximum Toxic Air Pollutant Concentrations
3.12-17	Ratio of Terminal Location Alternative Site Activity to Bayport Terminal Location Alternative

## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.12-18	Spilmans Island Related Emissions
3.12-19	Spilmans Island Related Offsite and Onsite Emissions
3.12-20	Spilmans Island Emissions Inventory Comparison to Bayport SIP Budget for NO <sub>x</sub>
3.12-21	Spilmans Island Emissions Inventory Comparison to Bayport SIP Budget for VOC
3.12-22	Shoal Point Related Emissions
3.12-23	Shoal Point Related Offsite and Onsite Emissions
3.12-24	Shoal Point Emissions Inventory Comparison to Bayport SIP Budget for NO <sub>x</sub>
3.12-25	Shoal Point Emissions Inventory Comparison to Bayport SIP Budget for VOC
3.12-26	Cedar Point Related Emissions
3.12-27	Cedar Point Related Offsite and Onsite Emissions
3.12-28	Cedar Point Emissions Inventory Comparison to Bayport SIP Budget for NO <sub>x</sub>
3.12-29	Cedar Point Emissions Inventory Comparison to Bayport SIP Budget for VOC
3.12-30	Pelican Island Related Emissions
3.12-31	Pelican Island Related Offsite and Onsite Emissions
3.12-32	Pelican Island Emissions Inventory Comparison to Bayport SIP Budget for NO <sub>x</sub>
3.12-33	Pelican Island Emissions Inventory Comparison to Bayport SIP Budget for VOC
3.12-34	Shoal Point/Bayport Related Emissions
3.12-35	Shoal Point/Bayport Related Offsite and Onsite Emissions
3.12-36	Shoal Point/Bayport Emissions Inventory Comparison to Bayport SIP Budget for NO <sub>x</sub>
3.12-37	Shoal Point/Bayport Emissions Inventory Comparison to Bayport SIP Budget for VOC
3.12-38	Upper San Jacinto Bay/Bayport Related Emissions
3.12-39	Upper San Jacinto Bay/Bayport Related Offsite and Onsite Emissions
3.12-40	Upper San Jacinto Bay/Bayport Emissions Inventory Comparison to Bayport SIP Budget for NO <sub>x</sub>
3.12-41	Upper San Jacinto Bay/Bayport Emissions Inventory Comparison to Bayport SIP Budget for VOC
3.13-1	Public Safety Services Available in the Study Area
3.13-2	MHLS Activities in the Houston-Galveston Area
3.13-3	Surface Transportation Related Releases for Harris, Chambers, and Galveston Counties During the Period of January 1, 1998 to December 31, 1999
3.13-4	Projected Dwelling Units by County as an Indicator of the Need for Fire Protection Services for the No Action and Terminal Location Alternatives, 2000 to 2030
3.13-5	Projected Number of Additional Law Enforcement Officers Needed to Accommodate Population Growth for the No Action and Terminal Location Alternatives, 2000 to 2030
3.13-6	No Action Population and the Projected Number of Additional Emergency Vehicles Needed as the Result of the Induced Population for the No Action and Terminal Location Alternatives by County, 2000 to 2030
3.14-1	Terms, Regulations, and Definitions of the Use and Transport of Hazardous Materials



## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.14-2	Applicant's Barbours Cut Terminal 1999 Hazardous Materials Inventory
3.14-3	Port Facilities Involved in the Use and Storage of Hazardous Materials and Other Regulated Substances
3.15-1	Bayport Land Cut Channel Bank Erosion Data
3.15-2	Site Rankings Based on Estimated Shoreline Impact
3.16-1	FEMA Floodplain Map Designations
3.16-2	Key HCFCD Design Criteria
3.16-3	Key Drainage Requirements for the City of Galveston
3.16-4	Tropical Storm Events That Have Impacted Galveston Bay Since 1900
3.16-5	Average Tidal Extremes
3.16-6	Selected Tidal Prisms in Galveston Bay
3.16-7	Galveston Bay Sub Watersheds
3.16-8	Land Use and Soil Types in Galveston Bay Sub-Watersheds
3.16-9	Current and Post Development Hydrology of the Bayport Site
3.17-1	TCEQ Water Quality Criteria and Uses in the Galveston Bay Estuaries
3.17-2	Categories for Water Bodies in Texas
3.17-3	2000 Section 303(d) List: Guidance for Assigning Priority for TMDL Development
3.17-4	Aquatic Life Protection Criteria in Water for Specific Toxic Materials
3.17-5	TCEQ Analytical Water Quality Results for Monitoring Stations Near the Bayport Ship Channel, Segment Number 2438
3.17-6	TCEQ Analytical Water Quality Results for Monitoring Stations Near Spilmans Island, Segment Number 2436
3.17-7	TCEQ Analytical Water Quality Results for Monitoring Stations Near Shoal Point, Segment Number 2421
3.17-8	TCEQ Analytical Water Quality Results for Monitoring Stations in Cedar Point Bay, Segment Number 2421
3.17-9	TCEQ Analytical Water Quality Results for Monitoring Stations Near Pelican Island, Segment Number 2439
3.17-10	TCEQ Analytical Water Quality Results for Monitoring Stations in the Upper San Jacinto Bay, Segment Number 2427
3.17-11	Bayport Ship Channel, Analytical Results for Water Quality Samples Collected in 1994
3.17-12	Bayport Ship Channel, Analytical Results for Water Quality Samples Collected in 1998
3.17-13	Bayport Ship Channel, Analytical Results for Water Quality Samples Collected in 1999
3.17-14	Barbours Cut Channel, Analytical Results for Water Quality Samples Collected in 1994
3.17-15	Barbours Cut Channel, Analytical Results for Water Quality Samples Collected in 1997
3.17-16	Barbours Cut Channel, Analytical Results for Water Quality Samples Collected in 1998
3.17-17	Barbours Cut Channel/Greens Bayou Channel, Analytical Results for Water Quality Samples Collected in 1992

## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.17-18	Houston Ship Channel Red Fish Reef to Morgans Point, Analytical Results for Water Quality Samples Collected in 1989
3.17-19	Houston Ship Channel Morgans Point to Carpenters Bayou, Analytical Results for Water Quality Samples Collected in 1992
3.17-20	Houston Ship Channel Red Fish Reef to Morgans Point, Analytical Results for Water Quality Samples Collected in 1997
3.17-21	Texas City Channel, Analytical Results for Water Quality Samples Collected in 1995
3.17-22	Cedar Bayou Channel, Analytical Results for Water Quality Samples Collected in 1995
3.17-23	Bayport Ship Channel, Analytical Results for Water Quality Samples Collected in 1999, 1998, and 1997
3.17-24	Houston Ship Channel Red Fish Reef to Morgans Point, Analytical Results for Elutriate Samples Collected in 1999, 1998, and 1997
3.17-25	Grain Size Summary, Bayport Ship Channel, Bayport Site
3.17-26	Houston Ship Channel USACE Dredged Material Sample Program, Analytical Results for Sediment Samples Collected in 1992, 1990, 1989, and 1987
3.17-27	Houston Ship Channel Sims Bayou to Turning Basin-Channel and Turning Basin USACE Dredged Material Sample Program, Analytical Results for Sediment Samples Collected in 1992, 1990, 1989, and 1987
3.17-28	Sample Locations, Water Depths, and Core Recovery for February 2001 Sampling Event Proposed Bayport Terminal Berths and Turning Basin
3.17-29	Water Quality Analytical Results for Samples Collected in February 2001 Proposed Bayport Terminal Berths and Turning Basin
3.17-30	Average Annual Point- and Nonpoint-Source Loads for Galveston Bay
3.17-31	Analytical Results for Sediment/Soil Samples Collected February 2001 Proposed Bayport Terminal Berths and Turning Basin
3.17-32	Analytical Results for Elutriates Samples Collected February 2001 Proposed Bayport Terminal Berths and Turning Basin
3.17-33	Variation of Temperature, DO, pH, and Salinity with Depth in Bayport Ship Channel
3.17-34	Barbours Cut Channel USACE Dredged Material Sample Program, Analytical Results for Sediment Samples Collected in 1998, 1997, 1994 and 1992
3.17-35	Texas City Channel USACE Dredged Material Sample Program, Analytical Results for Sediment Samples Collected in 1995
3.17-36	Texas City Channel USACE Dredged Material Sample Program, Analytical Results for Elutriate Samples Collected in 1995
3.17-37	Point-Source Loading for Bayport Ship Channel (1990)
3.17-38	Nonpoint-Source Loading for Bayport Ship Channel
3.17-39	Bayport Water Well Report
3.17-40	Point-Source Loading Near Spilmans Island
3.17-41	Nonpoint-Source Loading Near Spilmans Island

## VOLUME III

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF TABLES (Continued)

##### Table

3.17-42	Spilmans Island Water Well Report
3.17-43	Point-Source Loading Near Shoal Point
3.17-44	Nonpoint-Source Loading Near Shoal Point
3.17-45	Shoal Point Water Well Report
3.17-46	Point-Source Loading Near Cedar Point
3.17-47	Nonpoint-Source Loading Near Cedar Point
3.17-48	Cedar Point Water Well Report
3.17-49	Point-Source Loading Near Pelican Island
3.17-50	Nonpoint-Source Loading Near Pelican Island
3.17-51	Pelican Island Water Well Report
3.17-52	Point-Source Loading Near Upper San Jacinto Bay
3.17-53	Nonpoint-Source Loading Near Upper San Jacinto Bay
3.17-54	Upper San Jacinto Bay Water Well Report
3.17-55	Water Quality Data for the Applicant's Barbours Cut Facility
3.17-56	Estimated Average Loads in Stormwater Runoff
3.18-1	Sediment Quality Data
3.18-2	Historical Dredge Volumes
3.18-3	Estimated Dredge Volumes and Available Capacity
3.18-4	Grain Size Analysis for Proposed Site and Alternatives
3.18-5	Elutriate Data
3.18-6	Alternative Dredging Summary
3.18-7	Alternative Environmental Summary
3.18-8	Estimated Dredging Volumes for the Bayport Terminal Location
3.19-1	Wetlands on Each Alternative Site Mapped from Aerial Photographic Study (in Acres)
3.20-1	State and Federal Listed Species Potentially Occurring within the Project Vicinity
3.20-2	Dominant Upland Plant Communities Mapped in the Study Areas (in Acres)
3.20-3	Reptiles and Amphibians Potentially Occurring in the Study Areas
3.20-4	Bird Species Potentially Occurring in the Study Areas
3.20-5	Mammals Potentially Occurring in the Study Areas
3.20-6	An Abbreviated Checklist of Fish Species Potentially Occurring in Galveston Bay
3.20-7	Gulf of Mexico Non-Indigenous Marine Species
4-1	Year 2005 Level of Service Summary Cumulative Scenario (Bayport Plus Texas City)
4-2	Year 2015 Level of Service Summary Cumulative Scenario (Bayport Plus Texas City)
4-3	Year 2025 Level of Service Summary Cumulative Scenario (Bayport Plus Texas City)
4-4	Approved USACE Permit Applications, 1995-2002
4-5	Other Activities Existing and Proposed that May Cumulatively Affect Resources of Concern Associated with the Applicant's Proposed Project
4-6	Potential Cumulative Effects Associated with Key Scoping Issues

## **VOLUME IV**

### **PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT**

#### **LIST OF FIGURES**

##### **Figure**

1-1	Proposed Project
1-2	Port of Houston Area
2-1	Tier 1 Analysis Preliminary Terminal Sites
2-2	Terminal Location Alternatives
2-3	Alternative Development Location Spilmans Island
2-4	Alternative Development Location Shoal Point
2-5	Alternative Development Location Cedar Point
2-6	Alternative Development Location Pelican Island
2-7	Partial Build Development Location Shoal Point
2-8	Partial Build Development Location Bayport
2-9	Partial Build Development Location Upper San Jacinto Bay
3.2.1	Bayport Study Area
3.2.2	Spilmans Island Study Area
3.2.3	Shoal Point Study Area
3.2.4	Cedar Point Study Area
3.2.5	Pelican Island Study Area
3.2.6	Upper San Jacinto Bay Study Area
3.2.7	Coastal Zone Boundary
3.2.8	Spilmans Island Historical Land Use 1962
3.2.9	Spilmans Island Historical Land Use 1979
3.2-10	Spilmans Island Historical Land Use 1986
3.2-11	Spilmans Island Historical Land Use 1995
3.2-12	Spilmans Island Historical Land Use 2000
3.2-13	Historic Land Use Distribution Barbours Cut 1962-2000
3.2-14	Barbours Cut Land Use Distribution 1962
3.2-15	Barbours Cut Land Use Distribution 1979
3.2-16	Barbours Cut Land Use Distribution 1986
3.2-17	Barbours Cut Land Use Distribution 1995
3.2-18	Barbours Cut Land Use Distribution 2000
3.2-19	Bayport Historical Landuse 1944
3.2-20	Bayport Historical Landuse 1969
3.2-21	Bayport Historical Landuse 1979
3.2-22	Bayport Historical Landuse 1989
3.2-23	Bayport Historical Landuse 1995
3.2-24	Bayport Historical Landuse 2000
3.2-25	Historic Land Use Distribution Bayport 1944-2000
3.2-26	Bayport Land Use Distribution 1944

## **VOLUME IV**

### **PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT**

#### **LIST OF FIGURES** **(Continued)**

##### **Figure**

3.2-27	Bayport Land Use Distribution 1969
3.2-28	Bayport Land Use Distribution 1979
3.2-29	Bayport Land Use Distribution 1989
3.2-30	Bayport Land Use Distribution 1995
3.2-31	Bayport Land Use Distribution 2000
3.3-1	Wage and Salary Employment Estimates and Projections for the Three-County Area, 1980 to 2030
3.3-2	Comparison of Employment Growth by Major Economic Sectors for the Three-County Area, 1980, 2000, and 2030
3.3-3	Comparison of Employment by Major Economic Sectors for Chambers County, 1980, 2000, and 2030
3.3-4	Employment Distribution by Major Economic Sectors for Galveston County, 1980, 2000, and 2030
3.3-5	Comparison of Employment Growth by Major Economic Sectors for Harris County, 1980, 2000, and 2030
3.3-6	Percent Distribution of Direct Jobs by Economic Sector for the Applicant-Owned and Private Marine Terminals, 2000
3.3-7	Distribution of Direct Jobs by Economic Sector for the Applicant-Owned and Private Marine Terminals, 2000
3.3-8	Distribution of Direct Jobs by Commodity for Applicant-Owned and Private Marine Terminals, 2000
3.3-9	Percent Distribution of Total Direct Jobs for Applicant-Owned and Private Marine Terminals by Place of Residence, 2000
3.3-10	Distribution of Induced Jobs Generated by the Applicant-Owned and Private Marine Terminals, 2000
3.3-11	Commodity Tonnage for the Applicant-Owned Terminals, 2000
3.3-12	Percent Distribution of Direct Jobs by Economic Sector for Applicant-Owned Terminals, 2000
3.3-13	Distribution of Direct Jobs by Commodity Group for Applicant-Owned Terminals, 2000
3.3-14	Distribution of Business Revenue Generated by Applicant-Owned Terminals, 2000
3.3-15	The No Action Alternative Percent Distribution of the Total Marine Cargo Direct Jobs for the Applicant-Owned and Private Marine Terminals by Economic Sector, 2030
3.3-16	Comparison of the Total Employment Impacts of the No Action and Terminal Location Alternatives, 2030
3.3-17	Percent Distribution of the Total Marine Cargo Direct Jobs by Economic Sector for the Applicant-Owned (Including the Terminal Location Alternative) and the Private Marine Facilities, 2030
3.4-1	Population Estimates and Projections for the Three-County Area, 1980 to 2030
3.4-2	Bayport Community Study Area 2000 Census Tracts

## **VOLUME IV**

### **PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT**

#### **LIST OF FIGURES** **(Continued)**

##### **Figure**

3.4-3	Spilmans Island and Upper San Jacinto Community Study Area 2000 Census Tracts and Block Groups
3.4-4	Shoal Point Community Study Area 2000 Census Tracts and Block Groups
3.4-5	Cedar Point Community Study Area 2000 Census Tract
3.4-6	Pelican Island Community Study Area 2000 Census Tracts and Block Groups
3.4-7	Projected Racial and Ethnic Composition of the Three-County Area, 2000, 2015, and 2030
3.4-8	Projected Racial and Ethnic Composition of Chambers County, 2000, 2015, and 2030
3.4-9	Projected Racial and Ethnic Composition of Galveston County, 2000, 2015, and 2030
3.4-10	Projected Racial and Ethnic Composition of Harris County, 2000, 2015, and 2030
3.5-1	Traffic Analysis Locations Bayport Study Area
3.5-2	Traffic Analysis Locations Spilmans Island and Upper San Jacinto Bay Study Area
3.5-3	Traffic Analysis Locations Cedar Point Study Area
3.5-4	Traffic Analysis Locations Shoal Point Study Area
3.5-5	Traffic Analysis Locations Pelican Island Study Area
3.5-6	Railroad System
3.5-7	Barbours Cut Boulevard Traffic Count Program
3.5-8	Barbours Cut Original Survey Distribution
3.5-9	Locations of Drayed Traffic
3.5-10	Bayport Transportation Impact Analysis
3.5-11	Spilmans Island Transportation Impact Analysis
3.5-12	Shoal Point Transportation Impact Analysis
3.5-13	Cedar Point Transportation Impact Analysis
3.5-14	Pelican Island Transportation Impact Analysis
3.5-15	Shoal Point/Bayport Transportation Impact Analysis
3.5-16	Upper San Jacinto Bay/Bayport Transportation Impact Analysis
3.7-1	USCG Transit Checkpoints
3.7-2	Projected Total Weekly Vessel One-Way Transits
3.8-1	Noise and Vibration Monitoring Sites Bayport Study Area
3.8-2	Noise Monitoring Sites Spilmans Island Study Area
3.8-3	Noise Monitoring Sites Shoal Point Study Area
3.8-4	Noise and Vibration Monitoring Sites Cedar Point Study Area
3.8-5	Noise and Vibration Monitoring Sites Pelican Island Study Area
3.8-6	Noise Monitoring Sites Barbours Cut Study Area
3.8-7	Barbours Cut Terminal Additional Noise and Vibration Monitoring Sites
3.8-8	Vibration Measurement Results – Location V1
3.8-9	Vibration Measurement Results – Location V2
3.8-10	Low-Frequency Sound Measurements – Location P7-C
3.8-11	Low-Frequency Sound Measurements – Location P7-D-1

## VOLUME IV

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF FIGURES (Continued)

##### Figure

3.8-12	Low-Frequency Sound Measurements – Location P7-E
3.8-13	Low-Frequency Sound Measurements – Location P7-D-2
3.8-14	Vibration Measurement Results from Loading/Unloading of Container Ships (Vertical Axis Only)
3.8-15	Vibration Measurement Results from Train and Heavy Truck Activity – Location V5
3.8-16	Train Vibration Measurement Results – Location V8
3.8-17	Train Vibration Measurement Results (1) – Location V9
3.8-18	Train Vibration Measurement Results (2) – Location V9
3.8-19	Train Vibration Measurement Results – Location V18-1
3.8-20	Train Vibration Measurement Results – Location V18-2
3.8-21	Train Vibration Measurement Results – Location V18-3
3.8-22	Train Vibration Measurement Results – Location V18-4
3.8-23	Heavy Truck Vibration Measurement Results – Location V6a (Daytime)
3.8-24	Vibration Measurement Results – Location V6a (Nighttime)
3.8-25	Heavy Truck Vibration Measurement Results – Location V6b (Daytime)
3.8-26	Vibration Measurement Results – Location V6b (Nighttime)
3.8-27	Typical Construction Equipment Noise Generation Levels
3.8-28	Calculated Hourly Noise Contours – Bayport Marine Terminal
3.8-29	Normal Voice Sentence Intelligibility as a Function of the Steady Background Sound Level in an Indoor Situation
3.8-30	Location of Mitigation Noise Barriers – Bayport Marine Terminal
3.8-31	Calculated Hourly Noise Contours – Spilmans Island Marine Terminal
3.8-32	Calculated Hourly Noise Contours – Shoal Point Marine Terminal
3.8-33	Calculated Hourly Noise Contours – Cedar Point Marine Terminal
3.8-34	Calculated Hourly Noise Contours – Pelican Island Marine Terminal
3.9-1	Overview Map of Photo Locations Northern Sites (1 of 2)
3.9-2	Overview Map of Photo Locations Southern Sites (2 of 2)
3.9-3	View of the Bayport Site from the Bay Colony Subdivision, Looking South
3.9-4	View of the Bayport Site from Offshore Seabrook Point, Looking West
3.9-5	View of the Bayport Site from Park Drive and Cedar Street in El Jardin, Looking Northeast
3.9-6	View of Spilmans Island Site from Fred Hartman Bridge, Looking South
3.9-7	View of Spilmans Island from EGP Fuels, Looking East
3.9-8	View of Shoal Point from Texas City Dike Road, Looking South
3.9-9	View of Shoal Point from Texas City Channel, Looking East
3.9-10	View of Cedar Point Site from Offshore, Looking Northwest
3.9-11	View of Cedar Point Site from Offshore, Looking Northeast

## **VOLUME IV**

### **PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT**

#### **LIST OF FIGURES** **(Continued)**

##### **Figure**

3.9-12	View of Pelican Island Site from Elevated Texas A&M University at Galveston Dormitories, Looking North
3.9-13	View of Pelican Island Site from the Harbor Village Subdivision, Looking Northwest
3.9-14	Obstructed View from San Jacinto Park Road 1836, Looking South
3.9-15	View of Upper San Jacinto Bay Site from Offshore, Looking West
3.9-16	View of Upper San Jacinto Site from Miller Cut Off Road, Looking East
3.9-17	Artists Rendering of the Proposed Project from an Aerial View, Looking Southwest
3.9-18	View of PHA Barbours Cut Terminal from Spilmans Island, Looking South
3.9-19	View of PHA Barbours Cut Terminal from Galveston Bay, Looking West
3.9-20	Cross Section Locations
3.9-21	Conceptual Line of Sight Drawings for the Bayport Alternative
3.10-1	Cultural Resources – Bayport
3.10-2	Cultural Resources – Spilmans Island
3.10-3	Cultural Resources – Shoal Point
3.10-4	Cultural Resources – Cedar Point
3.10-5	Cultural Resources – Pelican Island
3.10-6	Cultural Resources – Upper San Jacinto Bay
3.11-1	Recreational Properties in the Study Area, 1 of 2
3.11-2	Recreational Properties in the Study Area, 2 of 2
3.12-1	Criteria Pollutant Monitoring Stations
3.12-2	NO <sub>x</sub> Annual Averaging Period 2010
3.12-3	CO 1HR Averaging Period 2010
3.12-4	CO 8HR Averaging Period 2010
3.12-5	SO <sub>2</sub> 3 HR Averaging Period 2010
3.12-6	SO <sub>2</sub> 24HR Averaging Period 2010
3.12-7	SO <sub>2</sub> Annual Averaging Period 2010
3.12-8	PM <sub>10</sub> 24HR Averaging Period 2010
3.12-9	PM <sub>10</sub> Annual Averaging Period 2010
3.12-10	PM <sub>2.5</sub> HR Averaging Period 2010
3.12-11	PM <sub>2.5</sub> Annual Averaging Period 2010
3.12-12	NO <sub>x</sub> Annual Averaging Period 2025
3.12-13	CO 1HR Averaging Period 2025
3.12-14	CO 8HR Averaging Period 2025
3.12-15	SO <sub>2</sub> 3HR Averaging Period 2025
3.12-16	SO <sub>2</sub> 24HR Averaging Period 2025
3.12-17	SO <sub>2</sub> Annual Averaging Period 2025
3.12-18	PM <sub>10</sub> 24HR Averaging Period 2025



## VOLUME IV

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF FIGURES (Continued)

##### Figure

3.12-19	PM <sub>10</sub> Annual Averaging Period 2025
3.12-20	PM <sub>2.5</sub> 24HR Averaging Period 2025
3.12-21	PM <sub>2.5</sub> Annual Averaging Period 2025
3.12-22	Diesel Particulate Annual Averaging Period 2010
3.12-23	Diesel Particulate Annual Averaging Period 2025
3.15-1	Bayport Study Area
3.15-2	Spilmans Island Study Area
3.15-3	Shoal Point Study Area
3.15-4	Cedar Point Study Area
3.15-5	Pelican Island Study Area
3.15-6	Upper San Jacinto Bay Study Area
3.16-1	Drainage Patterns, Well Locations, Sediment and Water Quality Stations: Bayport
3.16-2	FEMA Floodplain Data: Bayport
3.16-3	Drainage Patterns, Well Locations, Sediment and Water Quality Stations: Spilmans Island
3.16-4	FEMA Floodplain Data: Spilmans Island
3.16-5	Drainage Patterns, Well Locations, Sediment and Water Quality Stations: Shoal Point
3.16-6	FEMA Floodplain Data: Shoal Point
3.16-7	Drainage Patterns, Well Locations, Sediment and Water Quality Stations: Cedar Point
3.16-8	FEMA Floodplain Data: Cedar Point
3.16-9	Drainage Patterns, Well Locations, Sediment and Water Quality Stations: Pelican Island
3.16-10	FEMA Floodplain Data: Pelican Island
3.16-11	Drainage Patterns, Well Locations, Sediment and Water Quality Stations: Upper San Jacinto Bay
3.16-12	FEMA Floodplain Data: Upper San Jacinto Bay
3.18-1	Proposed Offsite Dredged Material Placement Areas
3.19-1	Wetland Data Panel Key
3.19-2	Wetland Data Panel A
3.19-3	Wetland Data Panel B
3.19-4	Wetland Data Panel C
3.19-5	Wetland Data Panel D
3.19-6	Wetland Data Panel E
3.19-7	Jurisdictional and Non-Jurisdictional Wetlands – Bayport
3.19-8	Aerial Image Illustrating Wetland Areas: Spilmans Island
3.19-9	Aerial Image Illustrating Wetland Areas: Shoal Point
3.19-10	Aerial Image Illustrating Wetland Areas: Cedar Point
3.19-11	Aerial Image Illustrating Wetland Areas: Pelican Island
3.19-12	Aerial Image Illustrating Wetland Areas: Upper San Jacinto Bay
3.19-13	Proposed Wetland Mitigation

## VOLUME IV

### PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT

#### LIST OF FIGURES (Continued)

##### Figure

3.20-1	Upland Habitats: Bayport
3.20-2	Upland Habitats: Spilmans Island
3.20-3	Upland Habitats: Shoal Point
3.20-4	Upland Habitats: Cedar Point
3.20-5	Upland Habitats: Pelican Island
3.20-6	Upland Habitats: Upper San Jacinto Bay
3.20-7	Oyster Reefs in Galveston Bay
4-1	Location of Past, Present and Future Actions in the Project Region
4-2	Location of Past, Present and Future Actions in the Immediate Project Area
4-3	HGA Population Growth versus the Annual Maximum Number of Ozone Exceedance Days at a Single Monitoring Site – 1980 through 1997
4-4	Number of Exceedance Days Versus Total Vehicle Miles Traveled (VMT) for Harris County
4-5	Galveston Bay Watershed
4-6	Cumulative Dredged Volume (New Work) in Galveston Bay Navigation Channels
4-7	Net Losses and Gains in Vegetated Classes (Excluding Aquatic Beds) from the 1950s to 1989 in the Galveston Bay System
4-8	Comparing Areas of Emergent and Forest/Scrub-Shrub Wetlands for the 1950s, 1979, and 1989 in the Galveston Bay System

## **VOLUME V**

### **PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT**

#### **APPENDICES**

- 1.0 PURPOSE AND NEED FOR THE ACTION
  - 1.1 Port of Houston Authority Permit Application
  - 1.2 Federal Laws and Regulations That Must Be Considered in the Permit Process
  - 1.3 Miscellaneous Port Statistics
- 2.0 PROJECT ALTERNATIVES
  - 2.1 Tier 3 Evaluation of Terminal Location Alternatives
  - 2.2 Sequence of Development
- 3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES
  - 3.2 Land Use and Coastal Zone Management
    - Section 501.14 Policies for Specific Activities and Coastal Natural Resource Areas
  - 3.4 Socioeconomics
    - 3.4-1 Potential EJ Index By Census Blocks
    - 3.4-2 An Assessment of Potential Economic Impacts of the Proposed Bayport Project on Local Recreation and Tourism
  - 3.5 Surface Transportation
    - 3.5-1 Modifications to Traffic Analysis
    - 3.5-2 Roadway Capacities
    - 3.5-3 2022 MTP Excerpts
    - 3.5-4 Data Collection Summary, Trip Generation, and Trip Distribution Methodology
    - 3.5-5 Shipping Company Interviews
    - 3.5-6 January 25 and 26, 2001 Meeting Minutes
    - 3.5-7 Trip Generation, Trip Distribution, and Travel Demand Modeling Outputs and Adjustments
    - 3.5-8 Sample Roadway Conditions Calculations
  - 3.9 Aesthetics and Light
    - Line of Sight Cross Section and Lighting Glare Study Elevation
  - 3.10 Cultural Resources
    - 3.10-1 State Historic Preservation Officer Letter
    - 3.10-2 Predictive Model for Prehistoric and Historic Site Location for the Bayport Container Terminal EIS Alternative Locations

## **VOLUMES VI and VII**

### **PROPOSED BAYPORT TERMINAL ENVIRONMENTAL IMPACT STATEMENT**

#### **APPENDICES**

#### **VOLUME VI**

- 3.12 Air Quality
  - 3.12-1 Air Quality Background Information
  - 3.12-2 Emission Inventory Procedures
  - 3.12.3 Air Quality Modeling Procedures
- 3.15 Shoreline Erosion
- 3.16 Hydrology, Drainage, and Flooding
  - 3.16.1 Drainage Area Maps and Grading Plans
- 3.18 Sediments and Dredged Material Placement
  - Sediment Report
- 3.20 Ecology
  - 3.20-1 USFWS Letter Pertaining to the Red Wolf
  - 3.20-2 Detailed Descriptions of EFH and Managed Species in the Project Area
- 6.0 CONSULTATION AND COORDINATION
  - 6.1 Public Notices

#### **VOLUME VII**

- 6.2 Comment Response Database